AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1.   (currently amended): A transport layer relay method <u>performed by a transport layer relay device, the method</u> ~~for~~ comprising:

terminating<u>, at the transport layer relay device,</u> ~~each of~~ a ~~plurality of~~ <u>first</u> transport layer ~~connections~~ <u>connection</u> between a first source terminal and a first destination terminal at a first transmission rate in the transport layer <u>and a second transport layer connection between a second source terminal and a second destination terminal at a second transmission rate in the transport layer;</u> ~~and~~

relaying data flow ~~on each~~ of said <u>first</u> transport layer ~~connections~~ <u>connection</u> to <u>said first destination terminal as a first relay connection and data flow of said second transport layer connection to said second destination terminal as a second relay connection to</u> respectively separate <u>said first and second</u> transport layer connections;

<u>determining a</u> ~~wherein the~~ total transmission rate of ~~relay~~ <u>said first and second relay</u> connections <u>based on the first and second transmission rates</u> ~~that are being used for relay is determined, and said total transmission rate is divided for allotment~~; <u>and</u>

<u>allocating the total transmission rate</u> ~~as the transmission rates~~ <u>among each</u> of <u>said first and second</u> relay connections ~~that are being used in relay~~<u>.</u>

wherein the first source terminal, the second source terminal, the first destination

terminal, and the second destination terminal are different from each other.

2.   (currently amended): A The transport layer relay method according to claim 1,

wherein said total transmission rate is determined in accordance with the number of transport

layer connections that are being relayed and the congestion conditions of the a network through

which the relay connections pass.

3.   (currently amended): A The transport layer relay method according to claim 1,

wherein said total transmission rate is determined in accordance with the number of transport

layer connections that are being relayed and the congestion conditions of the a network through

which the relay connections pass such that desired effective transmission rates are attained for all

each relay connections connection that are being used in relay.

4.   (currently amended): A The transport layer relay method according to claim 1,

wherein said total transmission rate is determined in accordance with the number of transport

layer connections that are being relayed and the congestion conditions of the a network through

which the relay connections pass such that effective transmission rates are attained for of all each

relay connections connection that are being used for relay can be attained while, and

wherein ~~conferring priorities to~~ transmission rates for traffic, other than the relay

connections, that ~~share~~ shares a ~~bottlenecks~~ bottleneck with the relay connections are allocated

differently than transmission rates allocated to the relay connections.

5.   (currently amended): ~~A~~ The ~~transport layer relay~~ method according to claim 1,

wherein said total transmission rate is ~~divided and allotted~~ allocated to transmission rates of each

of said first and second relay connections depending on application information in said data flow

~~on~~ of each of said first and second relay connections.

6.   (currently amended): ~~A~~ The ~~transport layer relay~~ method according to claim 1,

further comprising ~~wherein the results of~~ estimating, by means of measurement packets, ~~the~~

congestion conditions of a network through which the first and second relay connections pass,

wherein said congestion conditions are ~~also~~ used to determine said total transmission rate.

7.   (currently amended): ~~A~~ The ~~transport layer relay~~ method according to claim 1,

~~wherein the results of~~ further comprising estimating, by means of relay packets, ~~the~~ congestion

conditions of a network through which the first and second relay connections pass,

wherein said congestion conditions are ~~also~~ used to determine said total transmission rate.

8.   (currently amended): A transport layer relay device~~, wherein said transport layer relay device includes~~ comprising:

a ~~plurality of~~first terminal-side connection termination ~~units~~unit ~~for terminating~~that terminates ~~each of~~a ~~plurality of~~first transport layer ~~connections~~connection ~~with~~between a first source ~~terminals~~terminal and a first destination terminal in a transport layer;

a second terminal-side connection termination unit that terminates a second transport layer connection between a second source terminal and a second destination terminal in a transport layer;~~and~~

a ~~plurality of~~first interdevice connection termination ~~units~~unit ~~for~~that ~~terminating~~terminates ~~each of~~a ~~plurality of~~first transport layer ~~connections~~connection ~~between~~with a first transport layer relay ~~devices~~device ~~for~~that ~~relaying~~relays transport layer data between ~~each of~~said first terminal-side connection termination ~~units~~unit and ~~each of~~said first interdevice connection termination ~~units~~unit;

a second interdevice connection termination unit that terminates a second transport layer connection between a second transport layer device that relays transport layer data between said second terminal-side connection termination unit and said second interdevice connection termination unit; and

a transmission rate control unit that controls transmission rates of ~~wherein:~~said first and second interdevice connection termination units~~transmit in accordance with a transmission rate that is reported from a transmission rate control unit; and~~.

wherein the transmission rate control unit determines ~~the~~ a total transmission rate of all interdevice connection termination units ~~that are used in relay~~, ~~divides~~ allocates said total transmission rate among said first and second interdevice connection termination units, and reports ~~the~~ a ~~respective~~ transmission ~~rates~~ rate that ~~have~~ has been ~~divided and allotted~~ allocated to ~~each~~ said first and second interdevice connection termination ~~unit that is being used in relay~~ units, said first interdevice connection termination unit relaying said first transport layer connection to said first destination terminal as a first relay connection based on said allocated total transmission rate and said second interdevice connection termination unit relaying said second transport layer connection to said second destination terminal as a second relay connection based on said allocated total transmission rate, and

wherein the first source terminal, the second source terminal, the first destination terminal, and the second destination terminal are different from each other.

9.   (currently amended): ~~A~~ The ~~transport layer relay~~ device according to claim 8, wherein said transmission rate control unit determines said total transmission rate in accordance with the number of transport layer connections that are being relayed and ~~the~~ connection-specific congestion information ~~that is~~ reported from each interdevice connection termination unit.

10.   (currently amended): ~~A~~ The ~~transport layer relay~~ device according to claim 8, wherein said transmission rate control unit determines said total transmission rate in accordance with the number of transport layer connections that are being relayed and connection-specific

congestion information ~~that is~~ reported from each interdevice connection termination unit such

that ~~the~~ effective transmission rates ~~of all~~ for each relay ~~connections~~ connection ~~that are being~~

~~used in relay~~ attain a desired transmission rate.

11.   (currently amended): A The ~~transport layer relay~~ device according to claim 8,

wherein said transmission rate control unit determines said total transmission rate in accordance

with the number of transport layer connections that are being relayed and connection-specific

congestion information ~~that is~~ reported from each interdevice connection termination unit such

that ~~said~~ effective transmission rates ~~of all~~ for each relay ~~connections~~ connection ~~that are being~~

~~used in relay~~ are attained ~~while~~, and

wherein ~~conferring priorities to~~ transmission rates for traffic, other than the relay

connections, that ~~share~~ shares a ~~bottlenecks~~ bottleneck with the relay connections are allocated

differently than transmission rates allocated to the relay connections.

12.   (currently amended): A The ~~transport layer relay~~ device according to claim 8,

further comprising:

an application information analysis unit ~~for~~ that, when relaying transport layer data

between each of said first and second terminal-side connection termination units and each of said

first and second interdevice connection termination ~~unit~~ units, ~~analyzing~~ analyzes application

information in said transport layer data[[;]].

wherein said transmission rate control unit ~~divides and allots~~ allocates said total

transmission rate among the transmission rates of each of said first and second relay connections

based on the application information ~~from~~ analyzed by said application information analysis unit.

13.   (currently amended): A The ~~transport layer relay~~ device according to claim 8,

further comprising:

a network condition estimation unit ~~for~~ that, based on measurement packets, ~~inferring~~

estimates congestion conditions of ~~the~~ a network through which said first and second relay

connections pass[[;]],

wherein said transmission rate control unit ~~also~~ uses the ~~results inferred~~ congestion

conditions estimated by said network condition estimation unit to determine said total

transmission rate.

14.   (currently amended): ~~Any one of~~ The transport layer relay ~~devices~~ device

according to claim 8, further comprising:

an inline measurement unit ~~for~~ that, by means of packets that are relayed, ~~inferring~~

estimates congestion conditions of ~~the~~ a network through which said first and second relay

connections pass[[;]],

wherein said transmission rate control unit ~~also~~ uses the results ~~inferred~~ estimated by said

inline measurement unit to determine said total transmission rate.

15.   (currently amended): A transport layer relay method performed by a transport layer relay device, the method ~~for~~ comprising:

terminating, at the transport relay device, each of a plurality of transport layer connections in ~~respective~~ a first transport ~~layers~~ layer and each of a plurality of transport layer connections in a second transport layer; ~~and then~~

grouping the plurality of connections in the first transport layer ~~data flows on each of said transport layer connections~~ into ~~one~~ a first relay connection ~~transport layer connection~~ in the first transport layer ~~for relaying~~ and the plurality of connections in the second transport layer into a second relay connection in the second transport layer;

determining a total transmission rate of the first and second relay connections;

allocating the total transmission rate among each of said first and second relay connections, ~~wherein: the total transmission rate of the relay connections is determined, and~~

wherein the ~~data flows from each of~~ plurality of connections in said first transport layer ~~connections~~ are grouped as the ~~to a~~ first relay connection in accordance with ~~divided~~ a transmission ~~rates~~ rate allocated from the total transmission rate and the plurality of connections in the second transport layer are grouped as the second relay connection in accordance with a transmission rate allocated from the total transmission rate ~~of said total transmission rate~~.

16.   (currently amended): A The transport layer relay method according to claim 15,

wherein said total transmission rate is determined in accordance with the number of transport

layer connections that are being relayed and congestion conditions of the a network through

which the relay connections pass.

17.   (currently amended): A The transport layer relay method according to claim 15,

wherein said total transmission rate is determined in accordance with the number of transport

layer connections that are being relayed and congestion conditions of the a network through

which the relay connections pass such that desired effective transmission rates are attained for all

each relay connections connection that are being used in relay.

18.   (currently amended): A The transport layer relay method according to claim 15,

wherein said total transmission rate is determined in accordance with the number of transport

layer connections that are being relayed and congestion conditions of the a network through

which the relay connections pass such that an effective transmission rate rates are attained for of

all each relay connections connection that are being used in relay can be attained while , and

wherein conferring priorities to transmission rates for traffic, other than the relay

connections, that shares shares a bottlenecks bottleneck with the relay connections are allocated

differently than transmission rates allocated to the relay connections.

19.   (currently amended): A ~~The~~ ~~transport layer relay~~ method according to claim 15, wherein data flows from each of said plurality of connections in the first transport layer and the plurality of connections in the second transport layer are grouped ~~to a relay connection~~ in accordance with transmission rates for which said total transmission rate has been ~~divided~~ allocated based ~~depending~~ on application information in said plurality of connections in the first transport layer and the plurality of connections in the second transport layer~~data flows~~.

20.   (currently amended): A ~~The~~ ~~transport layer relay~~ method according to claim 15 further comprising, ~~wherein the results of~~ estimating, by means of measurement packets, congestion conditions of ~~the~~ network through which the first and second relay connections pass, wherein said congestion conditions are ~~also~~ used to determine said total transmission rate.

21.   (currently amended): A ~~The~~ ~~transport layer relay~~ method according to claim 15, ~~wherein results of~~ further comprising estimating, by means of relay packets, congestion conditions of ~~the~~ a network through which the first and second relay connections pass, wherein said congestion conditions are ~~also~~ used to determine said total transmission rate.

22.   (currently amended): A transport layer relay device ~~having~~comprising:

a plurality of terminal-side connection termination units for terminating that terminate

transport layer connections with between a plurality of source terminals and a plurality of

destination terminals in the transport layer;

one an interdevice connection termination unit for terminating that terminates a plurality

of transport layer connection connections between with a plurality of transport layer relay

devices that relay transport layer data between said plurality of terminal-side connection

termination units and said interdevice connection termination unit; and

an MUX-DEMUX unit for grouping that groups transport layer data from each of said

plurality of terminal-side connection termination units as a plurality of relay connections and

transferring transfers the plurality of relay connections to said interdevice connection termination

unit; and

a transmission rate control unit that determines a total transmission rate of the plurality of

relay connections and allocates each transmission rate of the plurality of relay connections based

on the total transmission rate,

wherein[[:]] said interdevice connection termination unit transmits said plurality of relay

connections to said plurality of destination terminals in accordance with a the total transmission

rate that is reported from a transmission rate control unit;,

wherein said MUX-DEMUX unit groups data from the plurality of terminal-side

connection termination units in accordance with the distribution of transmission rates that is

reported from allocated by the transmission rate control unit[[:]], and

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wherein the transmission rate control unit determines ~~and reports~~ the total transmission rate of said interdevice connection termination unit and reports the ~~distribution~~ allocation of rates among the plurality of relay connections ~~obtained by dividing said total transmission rate~~ to said MUX-DEMUX unit.

23.   (currently amended): ~~A~~ The ~~transport layer relay~~ device according to claim 22, wherein said transmission rate control unit determines said total transmission rate in accordance with the number of transport layer connections that are being relayed and congestion information of connections ~~that are~~ reported from the interdevice connection termination unit.

24.   (currently amended): ~~A~~ The ~~transport layer relay~~ device according to claim 22, wherein said transmission rate control unit determines said total transmission rate in accordance with the number of transport layer connections that are being relayed and congestion information of connections ~~that is~~ reported from the interdevice connection termination unit such that ~~the~~ effective transmission ~~rate~~ rates ~~of~~ for each of the plurality of relay connections ~~attains~~ attain a desired rate.

25.   (currently amended): ~~A~~ The ~~transport layer relay~~ device according to claim 22, wherein said transmission rate control unit determines said total transmission rate in accordance with the number of transport layer connections that are being relayed and congestion information

of connections that is reported from each interdevice connection termination unit such that the

effective rate-rates of-for each of the plurality of relay connections is-are attained while-, and

wherein conferring priorities-transmission rates for to-traffic, other than relay

connections, that shares-share a bottlenecks-bottleneck with the plurality of relay connections are

allocated differently than transmission rates allocated to the relay connections.

26.   (currently amended): A-The transport layer relay-device according to claim 22,

further comprising:

an application information analysis unit for analyzingthat analyzes application

information in transport layer data when transport layer data are transferred between each of said

terminal-side connection termination unit-units and said MUX-DEMUX unit[[;]],

wherein said transmission rate control unit divides-allocates said total transmission rate

among the transmission rates of each of the plurality of relay connections and determines the

distribution that is reported-reports the allocated transmission rates to said MUX-DEMUX unit

based on the application information from-analyzed by said application information analysis unit.

27.   (currently amended): A-The transport layer relay-device according to claim 22,

further comprising:

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a network condition estimation unit ~~for estimating~~that, by means of measurement

packets, estimates congestion conditions of ~~the~~a network through which plurality of relay

connections pass[[;]].

wherein said transmission rate control unit ~~also~~uses ~~the results inferred~~congestion

conditions estimated by said network condition estimation unit to determine said total

transmission rate.

28.   (currently amended): ~~A~~The ~~transport layer relay~~device according to claim 22,

further comprising:

an inline measurement unit ~~for estimating~~that, by means of packets that are relayed,

estimates congestion conditions of ~~the~~a network through which the plurality of relay

connections pass[[;]].

wherein said transmission rate control unit ~~also~~uses the ~~results inferred~~congestion

conditions estimated by said inline measurement unit to determine said total transmission rate.

29.   (currently amended): ~~A~~The ~~transport layer relay~~method according to claim 1,

wherein, when establishing a new transport layer connection between a new source terminal and

a new destination terminal, said total transmission rate is determined, said total transmission rate

is ~~divided for allotment as transmission rates~~allocated to each relay connection, and the allotted

transmission rates are reported to ~~the~~ <u>a</u> partner <u>transport layer relay device</u> in establishing said new transport layer ~~protocol~~<u>connection</u>.

30. (currently amended): ~~A~~ <u>The</u> ~~transport layer relay~~ device according to claim 8, wherein, when establishing a transport layer connection <u>between a new source terminal and a new destination terminal</u>~~with a terminal~~, <u>an</u> initial transmission rate ~~information~~ is reported to the destination <u>terminal</u> ~~terminal that is reported~~ from said transmission rate control unit.

31. (currently amended): ~~A~~ <u>The</u> ~~transport layer relay~~ method according to claim 15, wherein, when establishing new transport layer connection <u>between a new source terminal and a new destination terminal</u>, said total transmission rate is <u>allocated and the allocated transmission rates</u> ~~determined and rates obtained by dividing said total transmission rate~~ are reported to ~~said~~ <u>a</u> partner <u>transport layer relay device</u> in establishing ~~a~~ <u>said</u> new transport layer ~~protocol~~<u>connection</u>.

32. (currently amended): ~~A~~ <u>The</u> ~~transport layer relay~~ device according to claim 22, wherein, when establishing a transport layer connection <u>between a new source terminal and a new destination terminal</u>~~with a terminal~~, <u>an</u> initial transmission rate ~~information~~ that is reported from said transmission rate control unit is reported to the <u>new destination</u> terminal.

33.   (currently amended):   A program <u>embodied on a tangible computer-readable medium, which when executed by a computer,</u> ~~for causing~~ <u>causes</u> ~~a~~ <u>the</u> computer to function as <u>a transport layer relay device comprising</u>:

a ~~plurality of~~ <u>first</u> terminal-side connection termination ~~units~~ <u>unit</u> ~~for terminating~~ <u>that terminates a first</u> transport layer ~~connections~~ <u>connection between a first source terminal and a first destination terminal</u> ~~with a plurality of terminals on respective transport layers~~ <u>in a first transport layer</u>;

<u>a second terminal-side connection termination unit that terminates a second transport layer connection between a second source terminal and a second destination terminal in a transport layer;</u>

a ~~plurality of~~ <u>first</u> interdevice connection termination ~~units~~ <u>unit</u> ~~for both relaying transport layer data with each of said terminal-side connection termination units, terminating each of a plurality of transport layer connections between transport layer relay devices, and, when transmitting, transmitting in accordance with transmission rates that are reported from a transmission rate control unit~~ <u>that terminates a first transport layer connection with a first transport layer relay device that relays transport layer data between said first terminal-side connection termination unit and said first interdevice connection termination unit;</u>

<u>a second interdevice connection termination unit that terminates a second transport layer connection between a second transport layer device that relays transport layer data between said second terminal-side connection termination unit and said second interdevice connection termination unit; and</u>

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a transmission rate control unit that controls transmission rates of said first and second interdevice connection termination units ~~for determining the total transmission rate of all interdevice connection termination units that are being used in relay, dividing said total transmission rate, and reporting rates that have been divided and allotted to each of said interdevice connection termination units that are being used in relay~~,

wherein the transmission rate control unit determines a total transmission rate of all interdevice connection termination units, allocates said total transmission rate among said first and second interdevice connection termination units, and reports a transmission rate that has been allocated to said first and second interdevice connection termination units, said first interdevice connection termination unit relaying said first transport layer connection to said first destination terminal as a first relay connection based on said allocated total transmission rate and said second interdevice connection termination unit relaying said second transport layer connection to said second destination terminal as a second relay connection based on said allocated total transmission rate, and

wherein the first source terminal, the second source terminal, the first destination terminal, and the second destination terminal are different from each other.

34.   (currently amended): A program embodied on a tangible computer-readable medium, which when executed by a computer, ~~for causing~~ causes ~~a~~ the computer to function as a transport layer relay device comprising:

a plurality of terminal-side connection termination units ~~for terminating~~that terminate

transport layer connections ~~with~~ between a plurality of source terminals and a plurality of

destination terminals in the transport layer;

~~one~~ an interdevice connection termination unit ~~for terminating~~ that terminates a plurality

of transport layer connections ~~between~~ with a plurality of transport layer relay devices that relay

transport layer data between said plurality of terminal-side connection termination units and said

interdevice connection termination unit~~, and, during transmission, transmitting in accordance~~

~~with a transmission rate that is reported from a transmission rate control unit~~;

a MUX-DEMUX unit ~~for grouping~~that groups ~~, as one flow,~~ transport layer data from

each of said plurality of terminal-side connection termination units as a plurality of relay

connections and ~~transferring~~ transfers the plurality of relay connections to said interdevice

connection termination unit ~~in accordance with the distribution of rates that is reported from the~~

~~transmission rate control unit~~; and

a transmission rate control unit that determines a total transmission rate of the plurality of

relay connections and allocates each transmission rate of the plurality of relay connections based

on the total transmission rate~~for determining and reporting the total transmission rate of said~~

~~interdevice connection termination unit, and for reporting the distribution of rates obtained by~~

~~dividing said total transmission rate to the MUX-DEMUX unit~~,

wherein said interdevice connection termination unit transmits said plurality of relay

connections to said plurality of destination terminals in accordance with the total transmission

rate,

wherein said MUX-DEMUX unit groups data from the plurality of terminal-side

connection termination units in accordance transmission rates allocated by the transmission rate

control unit, and

wherein the transmission rate control unit determines the total transmission rate of said

interdevice connection termination unit and reports the allocation of rates among the plurality of

relay connections to said MUX-DEMUX unit.